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THESIS

THE NAVAL DATA AUTOMATION COMMAND:

A CASE STUDY

by

Nancy A. Lambert

December 1982

Thesis Advisor: C. R. Jones

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* The centralized functional organization of NAVDAC reflects this mission.

* No defined control systems exist against which to objectively evaluate NAVDAC.

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The Naval Data Automation Command: A Case Study

by

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requirements for the degree of

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- Created an ADP command designed to correct the problems of the past rather than implement future requirements.
- A discrepancy arose between NAVDAC's domain and its mission resulting in the pursuance of a modified mission.
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I. INTRODUCTION

A. GENERAL OVERVIEW

The Navy in 1976 faced a myriad of problems related to its management of non-tactical Automated Data Processing (ADP). The ADP Reorganization Implementation Study, tasked with developing a new ADP command, compiled a list of 93 problems confronting the Navy. With reference to this list, the House Appropriations Committee Survey and Investigations Staff (HAC S&I) in 1981 noted that,

> The perception of the Navy's ADP problems is largely conditioned by the organization and its position relative to the Navy (internal or external). The 93 items can be categorized into several major areas: organizational; lack of strong, central ADP authority; user/ADP community understanding and relationships; duplication of requirements and resources; and lack of cohesiveness in any aspect of Navy's ADP programs. [Ref. 1: p. 7]

The Naval Data Automation Command (NAVDAC) was established in January 1977 as part of the Navy's attempt to rectify ADP management.

B. RESEARCH QUESTION

The contents of this paper examine the ramifications of the lack of long range planning upon NAVDAC. Four different perspectives are taken, examining the effect upon NAVDAC's creation, mission, structure and control systems. The position taken is that because no plan existed:

1. The Navy created a centralized organization, without first identifying its long term goals and objectives and without evaluating non-centralized alternatives.

2. NAVDAC took as its primary mission the management and control of the Naval Regional Data Automation Centers (NARDAC's) in order to achieve domain consensus.
3. The present NAVDAC organization reflects this short range optimization and
4. Criticism of NAVDAC while potentially valid, is sporatic at best and generally unconstructive because there are not any defined goals.

The author does not hold with the opinion that NAVDAC should not have been established, but rather that it is impossible to measure progress towards goals and to evaluate the method of reaching objectives when no defined goals and objectives exist.

The major obstruction in the attempt to produce a Navy-wide long range plan for ADP management is an attitudinal difference between the individual user activities and ADP management. The user is concerned primarily with the effectiveness of ADP in supporting his individual mission. The manager is concerned with achieving a given level of overall efficiency at a minimal price. Neither position is completely right of wrong. The problem exists because a compromise position has not been reached.

II. THE NAVAL DATA AUTOMATION COMMAND: IT'S CREATION

A. INTRODUCTION

In 1976 the Navy found itself in a position where spiraling ADP costs and perceived Congressional pressure dictated a change in the management of non-tactical ADP. The perceived solution was the creation of an ADP command centralizing both policy and resource control. Hence the Naval Data Automation Command (NAVDAC) was formed on 1 January 1977.

The chapter contains first an examination of the concepts of centralization, decentralization and regionalization. Included is a model presented by Nolan describing the six stages of data processing growth within an organization.

The examination presented in the second section describes Congressional criticism of the Air Force data processing command and how the Navy interpreted this criticism to apply to the Navy ADP situation.

Thirdly an examination of Navy action leading up to the formation of NAVDAC is presented, including the status of ADP prior to NAVDAC.

The position held by the author is that NAVDAC was created in response to perceived, and possibly real, organizational pressures at the time. "More often, a corporation's existing EDP organization is the result of historic happenstance, the beliefs of influential managers, or an apparent fit with the overall organization structure" [Ref. 2: p. 73]. It is proposed that a more correct approach would have been the creation of a Navy-wide plan for non-tactical ADP, and then if warranted by the plan, the creation of an organization to implement the plan.

1. Centralization and Decentralization

Centralization and decentralization as used within the context of this paper refer to the level of the organization in which decision making occurs. In a centralized organization, decisions are made by individuals highly placed in the organizational hierarchy, whereas in a decentralized organization, the decision making responsibility is delegated lower in the organization. Benefits normally associated with centralization include elimination of redundant functions therefore lower overall cost. Often, because the decision maker is removed from the actual site, the quality of the decision deteriorates. Decentralization is assumed to produce a better decision, because the decision maker is closer to the scene. [Ref. 3: p. 111] Negatively, decentralization requires some degree of functional redundancy in that similar jobs are replicated in each division. Also decentralization can result in short term gains being pursued to the detriment of the whole.

In a purely theoretical context, centralization and decentralization relate merely to the level of decision making. It is assumed that in both instances the proper level of control is maintained. When long range planning is not carried out by an organization, control deteriorates because there is no yardstick against which a decision maker can measure his decisions. Each decision maker assumes that the choice made, while best within his particular context, will also be best for the organization as a whole. Since no plan exists it is difficult to assert otherwise. The problems caused by the lack of a long range plan do not become particularly evident in a centralized organization because decisions are made higher in the organization structure. The number of decision makers is reduced and the decision makers span of control is larger. Therefore the decision

maker has a broader picture and better concept of the needs of the entire organization. It is in a decentralized organization where the number of decision makers is increased and the span of control for the individual decision maker is reduced, that the lack of a long range plan becomes particularly evident. Therefore, centralization is often perceived as a method of increasing control, because the number of individuals holding decision making authority is reduced. In reality control is not necessarily increased, the coordination problem is merely lessened. As will be seen later, the relevance of this concept was that the Navy perceived centralization as a method of increasing control.

2. Regionalization

During the period of time surrounding NAVDAC's creation, it was assumed that economies of scale would be realized in the large computer center. In economic theory economies of scale mean that an increase in size of 100 percent will yield a greater than 100 percent output. "The concept of "economies of scale" in economics of production implies that a large system can produce output at a faster rate and at a lower cost that a smaller system" [Ref. 4: p. 83].

Regionalization refers to the actual physical location of a computer system, with the region being formed based on either functional or geographic lines. The assumed benefits to be gained through regionalization included:

- Users which individually could not afford computing capability could receive time on a regionalized computer.
- Better use could be made of programmers/ analysts by pooling them in a geographic area. Talent could be selectively drawn for specific projects and individual

growth through training achieved because of the larger number of applications being developed.

- Per unit cost of computing could be reduced because of the larger number of applications run. Additionally the greater workload of a large computer center justified more equipment, therefore more capabilities could be offered. [Ref. 2: p.74]

Regionalization does not necessarily imply centralized decison making and resource control. A decentralized activity with regionalized computing centers would exhibit a situation where individual centers would have more control over their respective activities. The economies of scale assumed to be realized through the monolithic computer center are not influenced by the level of decision making.

3. Data Processing Growth

Richard Nolan identifies six stages of data processing growth within an organization. Briefly these stages and their relevant characteristics are:

- Stage 1 - Initiation. Several low level operational systems in a functional area.
- Stage 2 - Contagion. A low control, high slack period that results in innovation and extensive application of data processing technology and concurrent increasing ADP costs.
- Stage 3 - Control. Characterized by a transition from computer (hardware) management to data resource management.
- Stage 4 - Integration. Data base and data communication technologies are moved into key application areas, with increased DP expenditures similar to stage 2.

- Stage 5 - Data Administration. Characterized by shared data and and common systems.
- Stage 6 - Maturity. Characterized by data resource and strategic planning.

Each stage is characterized by some measure of management control, with stages of low relative cost and low innovation equated to high control and stages of high relative cost, high innovation equated to low control. Therefore the level of control maintained influences both the utilization of resources and technological gains made by the organization. "When management permits organizational slack in the DP activities, it commits more resources to data processing than are strictly necessary to get the job done. The extra payment achieves another objective - nurturing of innovation" [Ref. 5: p.117].

Stages 2 and 4 exhibit explosive growth rates and corresponding data processing budget increases. Organizations finding themselves in these stages reach a point where the data processing budget increases become unacceptable and hence will seek some method of increasing control. Nolan suggests some methods of increasing control which include the development of standardized systems, thus decreasing costs by eliminating the need for locally unique systems, and chargeback methods, which place the financial responsibility upon the user, eliminating ADP as a free good.

B. GOVERNMENTAL INFLUENCES

Motivated by the Brooks Act of 1965, governmental attitudes favored centralization of resource control and regionalization of data processing activities as a method of controlling costs.

In 1975 Congress directed that "all automated system design, development or procurement, software maintenance, and equipment evaluation and selection required by any Air Force element will be accomplished by the Air Force Data Automation Agency" [Ref. 6]. Admittedly it was up to the Navy to place their interpretation upon this direction. Some officials felt that no Navy specific guidance should be read into the statement. The majority though felt that the fact that the Congress was now directing organizational change portended potential upheaval, particularly for the Navy, which lacked a strong centralized data automation command. "Generally, it is felt that...Congress expects (and in the case of the Air Force, directs) the Services to commence a centralization of automated system life-cycle support" [Ref. 7: pp. 12-13].

The apparent solution to the Navy had three characteristics; centralization of resource control, regionalized data processing centers, and chargeback systems. The latter characteristic will be discussed in greater depth in chapter 4. As stated by one Navy official:

> We seem to be at the point in time in the development of ADP technology when we should place more emphasis on management of ADP as a "common service" or as a "resource" to be made available to users on a reimbursable basis and not necessarily owned and controlled by them. This was recommended in the Blue Ribbon Panel Report. Second, it appears that there is now a great potential for savings to be made in equipment costs and personnel requirements through consolidation of present ADP activities either functionally or geographically. Third, more centralized overall coordination and control of ADP resources appear to be indicated because of the rigid data discipline requirements, the large personnel and equipment costs, and the multi-functional, multi-command, and multi-resource involvement of ADP in the Navy. [Ref. 8]

C. NAVY ACTIONS

1. NAVDAC's Predecessor : OP-91

At the time of the ADP reorganization in 1976, management control was resident in OP-91 (Director Information Systems Division). Created in 1968, OP-91 was the result of a 1966 study which recommended "the establishment of a strong, centralized organization in OPNAV to coordinate and control information and data systems" [Ref. 7: p. 7].

While policy control was centralized in OP-91, budgetary control, program design and data processing installation (DPI) operation was left to individual activities. "The fundamental management strategy in the Navy is centralized policy direction, decentralized program execution and decentralized control of resources" [Ref. 9: p. 43]. This conflicted with the governmental attitude previously expressed which emphasized centralization of resource control. By 1976 the Navy had 450 data processing installations (DPIs) supported by 12,500 people, of which only 636 were afloat. Most of these DPI's were single activity dedicated [Ref. 7: p. 10].

The situation of decentralized resource control resulted in duplication of functions, an inability to coordinate multi-command or common site applications across a disparate variety of users, and an inability to monitor ADP related costs with any degree of accuracy.

The unfavorable image presented by the Navy ADP management program was further aggrevated by comparison with the Air Force and Army. Both services had a centralized ADP command which provided high level policy direction. Additionally the Services maintained centralized control of automated data systems (ADS) development which provided for the successful standardization of systems that the Navy was

unable to maintain. "Both the Army and Air Force have established a central ADS development activity...for multi-command and common base operations ADS" [Ref. 7: p. 33].

Through various Navy management consolidations OP-91 wore four "hats". It reported not only to OP-090 in its OP-91 position, but to the Assistant Secretary of the Navy for financial management (ASN(FM)) as Director, Department of the Navy ADP, to OP-094 as OP-094E (Information Systems Coordinator, WWMCCS) and MAT-09 as MAT-09L for Naval Material Command (NAVMAT) data processing functions. [Ref. 7: p. 8]

Between fiscal year 1971 and fiscal year 1976 the Department of the Navy's ADP budget increased by $98 million from $278 million to $376 million. Hardware expenditures alone increased by almost 40% between fiscal year 1975 and 1976. Due to upward spiraling ADP expenditures the Office of the Secretary of Defense (OSD) implemented an obligational ceiling for ADP spending in March of 1973. Direct control was lacking though in that no prior approval was required to exceed the limitation. [Ref. 7: pp 77-78]

Despite the increase in the Navy's ADP budget, personnel staffing in OP-91 had decreased from 158 in fiscal year 1971 to 51 in fiscal year 1976. Consequently mission areas suffered or were ignored because of personnel constraints. These areas included:

- Long range planning.
- Monitoring of approved information systems development.
- Assessment of ADP facility and system performance.
- Research and development inputs to OP-098 for ADP exploitation in Navy information systems.
- Advice on ADP manpower requirements of the Navy.

- Central coordination of business and logistic ADS development and ADPE acquisition for operation shipboard and aviation requirements.

The opinion expressed by one Navy official concerning the status of Navy ADP management was that,

> Our present ADP structure appears as one which is radically fragmented and inefficient. The resultant problems are many. The most critical point, however, is that the Navy is just not doing the best it can with the resources available because of the inadequate control over resources. This structure protects the skills of yesterday, prevents Navy technological advances, and will not provide the management tools needed for tomorrow's Navy. [Ref. 10]

The concentration at the time was upon resource control. Relating back to Nolan's six stages of data processing growth, increased control signifies a move into a stage three organization. Unfortunately increased resource control does not necessarily imply improved resource management. Resource control suggests the ability to do with resources as one wishes. Management implies the utilization of resources to achieve the objectives of the organization in the best possible manner.

2. The Shear Memorandum

On 25 March 1976, Admiral Shear, Vice Chief of Naval Operations (VCNO), commissioned a study group under the direction of Rear Admiral James W. Nance to examine Navy ADP management. Since 50 percent of the Navy's non-tactical budget resided within the Naval Material Command (NAVMAT) the group was to consider the possibility of consolidating non-tactical ADP functions under NAVMAT. The delegating memorandum stated that,

> Over the past several years, OP-91 has been drastically reduced in personnel numbers, yet the function to be performed have increased....
>
> A large proportion of business ADP and information systems involve various parts of the Material Command. Therefore, it is appropriate to consider centralizing the execution of these functions in NAVMAT. An organization in NAVMAT could also assume cognizance over much of the ADP work currently going on in the various Systems Commands, perhaps with economies in personnel and hardware/software assets. [Ref. 11]

Specifically the study group was to address the feasibility of the centralized ADP command concept, a proposed organizational placement, the functions to be performed by the organization, and estimated costs and benefits.

Response from the Systems Commands was almost immediate and generally negative. The predominant opinion expressed was that a centralized command would reduce flexibility and inhibit the commander in the performance of his mission. Particular concern was addressed to the area of new systems development and responsiveness to the unique needs of the user. As stated by one Navy official,

> The proposal would effectively strip functional commanders (supply, maintenance, operators, etc.) of the resources required to carry out their responsibilities. Transfer of all Navy ADP personnel resources from their present functional commands to the control of a monolithic Computer Systems Command is considered an over-reaction to the genuine problem. While it is conceded that there are deficiencies and duplication of effort involved in the present Navy ADP management structure, it is felt that the proposed solution may lead to the opposite extreme; i.e., overstressing ADP standardization and economy to the detriment of responsiveness to the functional mission commander. ADP operations are not the heart of many operating logistic commands and without some control over their functions, it would be impossible to hold a commanding officer accountable for carrying out his mission. [Ref. 12]

An implicit assumption of the Systems Commands was that the user truly had unique needs, and that responsiveness could best be provided through decentralized resource control.

The statement also points to an additional problem, different perceptions of ADP by the user and the Navy hierarchy. The user command perceived ADP as a tool to assist in accomplishing the mission, whereas influenced by Congressional pressure, the Navy viewed ADP as an end item, to be economized as much as possible. Standardization to the user suggested unresponsiveness to his needs whereas standardization to the ADP manager suggested efficiency of operation.

3. The Nance Report

The interim report submitted by the Nance Committee to the VCNO delineated two alternatives that were being considered as viable solutions:

- Leave ADP directly under CNO by establishing a Computer Systems Command as a Field Command similar to the OP-094 relationship with the Telecommunications Command.
- Transfer ADP to the Chief of Naval Material (CNM) and establish a Deptuty Chief of Naval Material (DCNM), Project Management Office or a Computer Systems Command. [Ref. 13: p. 1]

Both alternatives included the transfer of staff, systems design and data processing operations to the new command.

While noting that the Systems Commands supported a more "status quo" approach of retaining systems design functions under control of the Systems Commands with staffing functions transferred to CNM, the report recommended the second alternative as the most feasible.

The final report submitted by the Nance Committee recommended that the new ADP command be located under CNM with a residual staff located under OP-094 to act as ADP program/budget sponsor and at the ASN(FM) level to assist in

reviewing automated data processing equipment (ADPE) requests.

Also recommended was the establishment of a follow on study group to consider in depth the logistics of creating a new command, including such actions as drafting a recommended charter, needed documentation and designing an internal organizational structure.

4. The ADP Implementation Study

The Navy ADP Reorganization Implementation Plan Study Group was the follow on group established as recommended by the Nance report. The report produced by the study group offered the first concise delineation of problems facing Navy ADP management. Up until this point progress had been made on the general premise that the Navy needed better control of its ADP resources and this control would be realized in the creation of a centralized command.

Two major problem areas were identified in Navy ADP management, first in Informations Systems Managment and second in Automatic Data Processing.

> Information Systems are an expression of functional managers' requirement for information needed to manage the functional area. Automatic Data Processing is one of many resources used to implement and support Information Systems...Better management or control of ADP will aid in improving Information Systems Management. [Ref. 7: p 23]

An implicit assumption in the above statement, and one that can be traced through the Navy action leading to NAVDAC's creation was that increased control of ADP would produce better information management. The author cannot concur with this assumption. ADP in the strictest sense is simply transaction processing. Improving ADP allows us to process information faster and at lower cost. In no instance does improving our processing ability guarantee that the

information we are collecting and processing is the correct information.

The Implementation Study concluded that "the Navy should place the management of its ADP resources in an ADP Command" [Ref. 7: p. 94]. Additionally it was recommended that the ADP Command assume responsibility for four regional data system support centers (SSC). It was hoped that this new organization would provide centralized control and centralized execution, similar to the Air Force and Army.

5. Summary

That changes were needed in the methods in which the Navy managed its non-tactical ADP resources was not questioned. Spiraling ADP budgets, redundant systems and billet cuts, combined with perceived Congressional pressure made this evident to the Navy. What was questioned was what constituted the proper changes. The majority favored a centralized command of some sort although the degree of centralization was greatly debated. Those who favored a more decentralized approach were largely ignored. One discenting individual stated that,

> The modern trend in the computing world is toward decentralization and away from the large computing centers we have known for years... in dissecting OP-91, we ought not to be talking about re-assembling it in some central-complex; we ought to be talking about dispersing its functions to take advantage of the capability of modern computers, not those of ten years ago. At the same time, we ought to be talking about iron-fisted control of those dispersed functions... [Ref. 14]

It is suspected that a decentralized philosophy towards ADP management was not viewed as feasible because it represented to many the embodiment of the exact problems that were being attempted to be corrected, redundant hardware, personnel and systems, and most importantly the lack of resource control. The opinion towards decentralized management as expressed by the Nance report was that,

> The completely decentralized management of the approximate 13,500 ADP personnel appears to fostor immobility, duplication of effort, inadequate career development and maldistricution of people in relation to the overall ADP workload.
>
> This decentralized management of the large computer installations has made it difficult, if not impossible, to accurately forecast overall hardware requirements and develop and implement a consolidated long-range ADP plan. [Ref. 15: p. 2]

The discussion appears to hinge on the question of how unique the systems operated by local commands were, and how responsive to the users a centralized command might be. The assumption of those favoring centralization was that responsiveness could be maintained.

D. CONCLUSIONS

The creation of NAVDAC was predicated upon solving the problems of the past with little or no consideration of the future of non-tactical ADP. The problems consisted of increasing ADP costs, redundant systems and untrained personnel. Perceived Congressional pressure favored centralization of policy and resource control. The Nance study group fulfilled its charter and examined the feasibility of a centralized command. Likewise the Implementation study produced the documentation necessary to implement the new command.

The lack of a long range plan is viewed by the author as the primary obstruction in the successful management of Navy ADP. The strategic planning process is that future oriented process resulting in the formulation of "a mission, goals, strategies, programs, and allocation of resources that will enable an organization to best cope with and influence an uncertain future" [Ref. 16: p. 45]. The important concepts are those of mission, goals and resources. A mission gives direction to an organization and makes it unique. Goals are quantifiable objectives against which an organization can be

measured and its performance evaluated. Resources are utilized to achieve the goals sought. The degree to which an organization complies with its strategic objectives determines its effectiveness.

The accomplishment of strategic planning in itself requires a commitment of organizational resources. Organizations unwilling to make this resource commitment lack a plan and consequently find themselves reacting to their environment rather than influencing it. The Navy found itself in this position with regard to ADP. NAVDAC was created in reaction to the environment rather than as a method of implementing the future. As stated by one individual,

> The usual method of approaching a task of the magnitude envisioned by the ADP staff study is to define the full objective sought, plan for its achievement, and organize to execute the plan. It appears that the ADP Study is beginning at the third step. It is considered that until the notional plans, including forecasts, objectives, strategies, programs, budgets, procedures and policies will have been converted into a DON System Plan that it appears premature to attempt to validate a concept to reorganize ADP personnel. [Ref. 17]

All action taken by the Navy concentrated on the creation of a centralized command. Such action concentrated upon solving the problems of the past, rather than attempting to cope with the future. It is proposed by the author that a more productive ADP management would have evolved had the Navy identified where it was going with ADP in the future and created a command to implement the future. The problems encountered in the past are not necessarily the problems of the present or the future.

III. NAVDAC: IT'S MISSION

A. INTRODUCTION

When NAVDAC was formed its stated mission was to control those resources assigned to it (the Data Processing Installations (DPIs)) and to manage the Navy non-tactical ADP program, including budget coordination.

Interviews conducted in conjuction with this paper have suggested that there is currently confusion over what NAVDAC's mission is and should be. Two parties of thought appear to exist. One views NAVDAC's mission as being solely to manage the operation of the Navy Regional Data Automation Commands (NARDAC's). A second view held is that NAVDAC exists primarily to manage the Navy-wide ADP program. The examination contained in this chapter seeks to document the historical roots of this confusion and suggest that such confusion might have been circumvented had a Navy-wide ADP plan been in existence.

First examined in this chapter will be the concept of mission and domain, and the ramifications when consensus is not achieved. Mission consensus will be discussed from the intra-organizational aspect and domain consensus from the aspect of the organization and its relevant environment.

Secondly the discussion will focus upon NAVDAC's specific domain and mission, suggesting that NAVDAC limited its domain and concentrated on achieving only a portion of its mission in order to ensure organizational survival.

It is felt by the author that the confusion over NAVDAC's mission stems from a discrepancy between NAVDAC's mission and NAVDAC's domain. Specifically, that the domain is too limited for NAVDAC to achieve its original mission, hence a modified mission was pursued.

B. MISSION

The mission of an organization is "the broadest strategic planning choice" [Ref. 16: p. 47]. It is the organization's specific mission that makes it unique from others. Too narrow and restrictive a mission choice detracts from an organization's ability to cope with a changing environment. Too broad a mission encourages an organization to pursue sometimes unrelated markets based solely on potential for profit, when no management expertise exists internal to the organization. Missions are not static but can evolve, generally doing so slowly.

A primary characteristic of the mission is that it needs to be explicitly stated. By doing so a comparison can be made between individual and organizational goals.

> One of the primary values of explicit statements of mission and objectives is that they provide a rallying point for those who can ally themselves with them and a clear indication to those who cannot that they might wish to consider alternative organizations as the source of their economic and psychic satisfaction. [Ref. 16: p. 143]

When an organization fails to explicitly state its mission its rallying point is lost. "Organizations that do not discuss their basic mission and purpose will inevitably lose whatever consensus may have once existed among its members as to their common purpose" [Ref. 16: p. 143]. This loss of mission consensus can be due to environmental and personnel changes, that alter the complexion of the organization. As will be demonstrated, within NAVDAC this loss of mission consensus has been exemplified by an overemphasis upon the service oriented portion of its mission to the detriment of its policy oriented mission.

Long range plans assist an organization in the implementation of its mission, delineating objectives and milestones to be met. When a formal plan is non-existent, an organization lacks definitive guidance on the action to be taken in order to accomplish its mission.

C. THE ORGANIZATIONAL CONCEPT OF DOMAIN

Mission consensus refers to internal agreement among organizational members. Domain consensus refers to an agreement between an organization and its relevant environment. The domain of an organization defines the;

- technologies (hardware, software, personnel) used by the orgainzation,
- the population served, and
- goods or services supplied to the clients [Ref. 18: p. 229].

The relevant domain of an organization influences the chances of an organization achieving its mission. Too small a domain suggests that the entire mission will not be achieved because the environment will not recognize the organization's right to provide that service.

The particular importance in the concept lies in the fact that the domain "determines the points at which the organization is dependent upon others for the resources, referrals, and other types of support required for its survival" [Ref. 19: p. 20].

Because resources (clients, money, technology) are limited the potential for conflict exists between an organization and its relevant environment. Domain consensus

> defines a set of expectations, both for members of an organization and for others with whom they interact, about what the organization will and will not do. It

> provides, although imperfectly, an image of the organization's role in a larger system, which in turn serves as a guide for the ordering of action in certain directions and not in others. [Ref. 20: pp. 28-29]

The implication is that when domain consensus is not achieved, resource contention will exist between the organization and its task environment. Since resources are needed for the organization to achieve its mission, failure to achieve domain consensus can effect the future survival of the organization. "A domain becomes operational only when the organizations' rights to domain are recognized by those whose support is needed" [Ref. 19: p. 20]. Because the defense of one's domain is resource costly, it is the author's presumption that NAVDAC reduced its cost and ensured its survival by reducing the size of its domain.

Two major points are evident. The first that domain consensus must be achieved for organizational survival. The second that too small a domain may inhibit the accomplishment of the entire mission. When the environment does not recognize the organization's right to perform a certain service, contention arises. With the Navy this unrecognized domain element was policy formulation.

D. NAVDAC'S DOMAIN

The ADP Implementation Study recommended that the following data processing resources be transferred to the new ADP command:

- OP-91 Staff, less those personnel transferred to OP-942
- ADP Equipment Selection Office (ADPESO)
- Naval Command Systems Support Activity (NAVCOSSACT)
- Naval Material Command Support Activity (NMCSA)

- Naval Accounting and Finance Center/ Comptroller of the Navy's ADP resources
- Naval District, Washington's ADP resources.

  The losing parent organization of the above activities was to transfer along with the activity, a pro rata share of its supporting resources.
- DATA Processing Service Centers (DPSCs)

  Norfolk

  Jacksonville

  Pensacola

  San Diego

  Alameda
- Manpower Analysis Centers - LANT/PAC ADP resources
- Fleet Assistance Groups - LANT/PAC ADP resources
- Naval Regional Finance Centers (NRFC) ADP resources

  Norfolk

  Great Lakes

  San Diego

  San Francisco [Ref. 7: p. 96].

The choice of activities centered around those whose incorporation supported the regionalized data processing center concept.

> The ADP field activities selected were those presently chartered to : (a) provide general support either within a geographical region, such as the DPSCs, or to a set of customers, such as NAVCOSSACT and NMCSA, (b) perform fleet support mission, such as FAGLANT and NMACLANT, and (c) provide specialized functions that would readily be made part of the SSC concept, such as NRFCs...Consolidations will provide long term economies which will be validated after an appropriate period of operations. [Ref. 7: v.2, p. J-1]

The Nance Report, discussed in the previous chapter, examined the feasibility of establishing an ADP command under the auspices of NAVMAT. Recommended for consolidation in the Nance Report, but not included by the follow on Implementation Study were the Central Design Activities (CDA's) belonging to the various Systems Commands. A CDA provides, for its respective functional command, systems and programming support. Multi-command applications confined to one functional area would not fall under the cognizance of NAVDAC but under the functional sponser. Specifically the CDA's and their functional sponsors were:

- CENO - Naval Sea Systems Command
- CASDO - Naval Sea Systems Command
- MSDO - Naval Air Systems Command
- FACSO - Naval Facilities Engineering Command
- FMSO - Naval Supply Systems Command

Justification for the exlusion of the CDA's was based upon the fact that "NAVDAC and its subordinate ADP Support Centers have been established principally on the basis that the Command is responsible for pure data processing functions" [Ref. 7: p. 47]. It was felt that the cost (stated in terms of performance) of separating the data processing functions from the CDA's would far outweigh the benefits to be gained. Additionally it was stated that if in the future NAVDAC demonstrated the capabilities to handle these additional responsibilities, then consideration could be made as to their transfer. [Ref. 7: p. 47]

In terms of our definition of domain , the technologies used were those activities transferred to NAVDAC. The population served were those Navy activities needing general ADP support. The service provided was pure data processing.

Excluded from the domain were the Systems Commands and their respective CDA's.

This activity division, while pacifying the Systems Commands brought about the first problem with NAVDAC's conception of it's mission, a concentration on the general data processing installation. This was despite the fact that NAVDAC was still to retain CDA responsibility for multi-function applications.

Interviews with Navy officials revealed that NAVDAC felt that to assume control of the CDA's would be too large a job initially. The approach was to get one's own house in order before expanding. Provision was made for NAVDAC to evaluate in the future the concept of centralized control of the CDA's.

A point should be made at this time concerning the lack of a long range plan. Without such a plan no evaluation criteria exist. Without these criteria it becomes impossible to prove objectively that NAVDAC, at any time, was ready to assume responsibility for CDA control. Those individuals disputing NAVDAC's right to manage the CDA's could offer a counter arguement at any time. Additionally no time frame was ever established for the projected expansion.

The thesis is not making an attempt to support the position that control of the CDA's should reside with NAVDAC. Instead it is trying to point out that proponants of the idea would have had better justification had some measurable milestones been established when NAVDAC was formed.

E. NAVDAC'S MISSION

The centralization of policy in an ADP command was not a new move. Up until the creation of NAVDAC, Navy policy in the area of non-tactical ADP had been centralized control with decentralized program execution. OP-91 had been

created to effect this centralized control, but successive billet cuts had reduced OP-91's mission effectiveness.

OPNAVINST 5450.200 was released in December, 1978, almost two years after the formation of NAVDAC was announced. It stated the mission of NAVDAC as being to:

> Administer and coordinate the Navy non-tactical ADP program. This responsibility includes collaboration of ADP matters with all Navy ADP claimants; development of policy and procedures; approval of systems development, acquisition/utilization of ADP equipment and service contracts; sponsoring of ADP technology, and career develpment and training of ADP personnel. [Ref. 21: enclosure 1, p. 1]

The functions delineated as to be performed by NAVDAC, almost exclusively concern coordination of Navy-wide ADP. Yet the House Appropriations Committee, Survey and Investigations Staff (HAC S&I) described NAVDAC in 1981 as being "relatively ineffectual in carrying out its mission responsibilities from a Navy-wide standpoint" [Ref. 22: p. 141]. The position held by the author is that the OPNAVINST was promulgated two years too late. By the time it was published, NAVDAC had concentrated its economic resources on NARDAC management and established its domain as general data processing support to user commands.

The original intent of NAVDAC in the policy arena was described in the ADP Implementation Study, discussed in chapter 2. In the Implementation Plan it was stated that "NAVDAC will develop, in consonance with policy guidance from the ASN(FM), the CNO, and other higher authority, concepts, objectives, plans, and procedures relating to ADP and information systems management in the Navy" [Ref. 7: v.2, p, D-33]. Additionally, "NAVDAC will develop revised ADP rules/directives/regulations and monitor compliance" [Ref. 7: v.2, p. D-33].

Two assumptions appear to have been made by the Implementation Study, which have not proved to be valid over time. The first assumption is that NAVDAC would receive adequate policy guidance. When adequate policy guidance is not forthcoming an organization can take one of two different directions; 1) either develop policy internally and submit for approval, or 2) concentrate resource utilization on that portion of the organizational mission where successful results might be realized. The HAC S&I attributed the failure of internal policy development to the fact that NAVDAC was buried too low in the organizational hierarchy to be effective. "As a result, commands with more senior level support (three- and four-star flag rank) are able to influence the actions of NAVDAC irrespective of the merits of the issue" [Ref. 22: p. 144]. The Navy officially disagreed with the Committee's comments concerning the organizational placement of NAVDAC.

The author's assessment is that NAVDAC never had a chance to effect real change in the area of Navy-wide ADP management. Not necessarily due to its organizational placement but because of domain consensus. The domain allotted to NAVDAC consisted of control of general purpose regionalized centers. Success in the area of Navy wide policy would have resulted in trespassing into domains belonging to other organizations in the relevant environment, and ultimately resulted in resource conflict. It is felt by the author that this situation would have transpired regardless of NAVDAC's organizational placement.

The second assumption is that NAVDAC, along with monitoring compliance with ADP policy, might effect some remedial action. Location of NAVDAC under the CNO was advised because of the necessary clout that would be needed "in a down chain direction in order to direct performance of all Navy activities" [Ref. 7: p. 69]. Whether this clout

has been underutilized, or the remedial action was ignored, the HAC S&I stated in 1981 that, "the major claimants...were each observed to be abiding by their own policies and procedures which had been established long before the advent of NAVDAC" [Ref. 22: p. 142]. Again this failure to demonstrate the clout desired stems from a reluctance to interfere in what is not considered NAVDAC's domain.

Realizing that policy is an area in which only limited progress has been made NAVDAC has taken to issuing advisories. Carrying no ramifications if not followed, the advisories offer advice to commands based upon lessons learned.

In view of the circumstances surrounding NAVDAC's establishment, one must question whether the Navy actually needed a new centralized organization. OP-91, although admittedly understaffed, already existed to effect centralized policy. The major addition to NAVDAC was the incorporation of the DPI's. This move was in keeping with the emphasis upon reducing costs and increasing efficiency through economies of scale.

F. LONG RANGE PLANNING

Interviews with Navy officials have suggested that there is a lack of consensus at all levels of the Navy concerning the mission of NAVDAC. The origins of the loss of mission consensus stems from NAVDAC's selection of a limited domain. This limitation achieved domain consensus and reduced NAVDAC's dependency upon the environment, probably ensuring NAVDAC's survival, but at an organizational cost. It is felt that those who propose NAVDAC's mission as being that of managing the NAVDAC's, are viewing primarily the domain NAVDAC has to work with. Conversely, those who view NAVDAC as existing to manage Navy-wide ADP are considering primarily NAVDAC's mission statement.

The limited domain represents a loss of direct control by NAVDAC over a large portion of Navy non-tactical ADP. Implementing policy without direct control over the relevant activities has proved to be non-productive, therefore reinforcing NAVDAC's concentration upon the DPI's, where progress can be realized. By allowing the System Commands to retain control of the CDA's, NAVDAC's chances of developing successful standardized systems across function lines have been decreased.

Two thoughts are offered for consideration. The first is that had a long range plan been in existence prior to the formation of NAVDAC, the inconsistency between NAVDAC's mission and domain might have been resolved. Either by decreasing NAVDAC's mission or increasing NAVDAC's domain. Because no defined goals and objectives existed it became difficult to recognize that action taken by NAVDAC did not support the entire mission.

The second thought is that it has proved impossible since NAVDAC's creation to publish an effective long range plan and probably will continue to remain so, because of the domain consensus problem. Long range planning on a Navy-wide basis would dictate involvement in other's domains, which it is suspected would prove to be unacceptable.

Because a long range plan was non-existent, the concentration upon the NARDAC's was allowed to continue. Progress was being demonstrated, although its contribution to overall areas could not be measured. Chapter 4 will attempt to demonstrate how the concentration upon the DPI's, and short range results influenced the organizational structure that NAVDAC developed.

G. SUMMARY

The major point addressed in the first two chapters of this paper has concerned the problems that have arisen due to the lack of a non-tactical ADP strategic management plan. That such an item is difficult to produce is admitted. ADP involves all functional areas and while Congress and the Navy may feel the need to more tightly control ADP expenditures, individual commands may see ADP as simply a tool to be used in the performance of a mission.

What is the status of the strategic management plan? "In December 1978, GAO reminded the Navy that it had not developed an integrated long range plan for its ADP program. A firm commitment was made by the Navy at this time to develop such a plan in 1979" [Ref. 23: p. 21].

A draft Department of the Navy Strategic Management plan for ADP has been developed but holds little promise for helping to remedy the situation. In it's introduction, the Plan states that "the Plan does not address a specific time frame. The goals are not intended to represent desired specific, achievable results, and in fact may never be fully attained. Rather, they represent broad areas that future ADP-related efforts are expected to focus on" [Ref. 24].

The plan is divided into two general sections, strategic ADP goals and functional automation goals. The strategic ADP section is representative of the direction the Navy would like to move with regard to ADP in general, standardization, training, etc. The functional area refers specifically to areas for development and demonstrates no direct relationship to the general goals laid out in the strategic section. Functional sponsors are encouraged to adopt Navy goals in the specification of new systems, but the plan makes no provision for coordination across functional areas.

IV. NAVDAC: ITS ORGANIZATION

A. INTRODUCTION

The following chapter contains an examination of NAVDAC's internal organization. The position held by the author is that NAVDAC's functional organization is a reflection of their mission choice to concentrate on the DPI's. Based upon work by Chandler, the discussion will focus on the strategy adopted by NAVDAC, and how this is exemplified by the functional organization.

The NARDAC's will be discussed as boundary spanning units. Based upon a model developed by Ouchi and Barney, the change in data processing services from mission funding to Naval Industrial Funding (NIF) will be discussed. This section provides an example of a transaction (the "sale" of data processing services) as it occurs internal and external to the organizational boundaries.

Both structure as a result of strategy, and transaction governance will be examined as attempts to ensure the future survival of the organization.

Finally, the subject of reorganization will be discussed, with an alternative functional organization proposed.

B. STRATEGY AND STRUCTURE

1. Organizational Theory

Strategy has been defined earlier as "broad programs for achieving the organization's objectives and thus implementing its mission" [Ref. 25: p. 100]. Nathanson further refines this definition by pointing out that the objectives

pursued are those developed during the "strategy formulation process" [Ref. 19: p. 3].

Structure is "the design of organization through which the enterprise is administered" [Ref. 19: p. 5]. Characterized by two components 1) lines of communication and authority and 2) lines of information and data flow, several structural types exist including the centralized functional organization of which NAVDAC is representative.

The position proposed by Chandler is that an organization's strategic choices will influence its organizational structure. Firms with a chosen mission and strategy will adopt a structure suited to the accomplishment of the strategy. Since strategy formulation is an on going process, strategies can change based upon the changing environment and organizational mission. Likewise the organizational structure is dynamic, undergoing modification to produce that structure which reflects the current strategy. As summarized by Nathanson:

> Chandler's general thesis is that structure follows strategy. Changes in a firm's strategy result from an awareness of the opportunities and needs - created by changing population, income, and technology - to employ existing or expanding resources more profitably. The new strategy brings about new administrative problems, however. These new administrative problems require a new or, at least, a refashioned structure if the enlarged enterprise is to operate efficiently. [Ref. 19: p. 6]

Chandler delineates four organizational forms each representative of a different growth strategy. These four forms are the centralized functional, the decentralized multifunctional, the holding company, and the matrix form. [Ref. 19: p. 5] NAVDAC represents the centralized functional form. As discussed in Chapter 2, the Implementation study saw their task as taking "a realistic review of the functions to be performed and development of an organizational

structure (including assignment of responsibilities) to accomodate those requirements" [Ref. 7: p. 23]. The structure recommended by the Implementation Plan and adopted by the Navy was a centralized functional command.

Organizational growth can occur through initial volume expansion, geographic expansion, vertical integration and product diversification. It is in the period of geographic expansion that the functional organization arises offering a solution to "administrative problems of interunit coordination, specialization, and standardization" [Ref. 19: p. 13]. These problems were all demonstrated prior to the formulation of NAVDAC. Control of ADP resources was decentralized therefore increasing the complexity of interunit coordination. Standardization of systems, particularly across command lines was ineffective, each command claiming their unique mission as justification for specialized systems.

A major concept is that of the fit between an organization's strategy and structure. Goodness of fit implies a better utilization of resources. Resources are defined as those items utilized by the organization in the achievement of its mission. The effectiveness of an organization, and ultimately its survival will depend upon its goodness of fit. The importance of this concept is not nearly so noticeable during times of economic prosperity. It is during times of resource scarcity that the organization if forced into change. "Organizations do not change their structures until they are provoked by inefficiency to do so" [Ref. 19: p. 13].

2. The Functional Organization of NAVDAC

NAVDAC offers two major products, 1) DPI management and 2) Navy wide ADP management. As discussed in Chapter 3, NAVDAC through default (lack of a Navy-wide ADP strategic

management plan, and inadequate support in the policy arena) adopted a short range strategy, that of managing the NARDAC's. It is the opinion of the author that the current organization of NAVDAC reflects this decision.

If as postulated, NAVDAC has concentrated on the DPI portion of its mission, it would be expected to take on the characteristics of a single product firm and hence a greater degree of centralization would be evidenced than by a multi-product firm. The greater degree of centralization arises because the organizational structure will influence the degree of centralization/ decentralization exhibited. "The functional organization is usually more centralized, and its departments are specialized and arranged by function" [Ref. 19: p. 6].

The matrix organization combines characteristics of both the functional and product oriented organizations. NAVDAC attempted a product oriented organization by including both operational and strategic responsibilities within its departments. This was evidenced by individuals interviewed who refered to NAVDAC as a matrix organization. The technical codes, 30, 40, and 50 combine the responsibilities for the Navy-wide and DPI programs within their respective areas (systems software, applications software, and DPI operations respectively). The formation of a functional vice a matrix organization resulted because NAVDAC chose to concentrate upon the DPI portion of its mission. As noted by the HAC S&I, "It was estimated that over 80 percent of NAVDACs code 30, 40, and 50 effort is geared to coordination and management of the NARDAC's" [Ref. 22: p. 144].

NAVDAC's structure has evolved towards a functional organization designed around the function of managing data processing installations. This functional organization became even more evident after the 1979 reorganization in

which "six directorates and some special staff office elements were combined into two directorates, streamlining the Command along functional lines" [Ref. 26: p. 10].

C. ORGANIZATIONAL BOUNDARIES

The boundary "of a system is a closed line placed around certain objects so that there is less intensity of interaction across the line or among objects outside the line than among objects within the closed line" [Ref. 18: p. 216].

With regard to the NAVDAC organization the boundary encompasses NAVDAC and the NARDAC's/NAVDAF's. External to the boundary but still part of the relevant environment are the users, the CDA's, and Congress. This section of the thesis will focus upon the user as he relates to the NARDAC's across the boundary. In this respect the NARDAC's become boundary spanning units. The relationship will be examined with regard to the "sale" of data processing services and the implications organizationally of NIF funding.

As defined above, a boundary includes some form of interaction across the closed line. An example of an interaction may be a transaction or "an economic exchange between two or more parties" [Ref. 27: p. 3]. In determining the placement of an organizational boundary Ouchi and Barney propose an efficiency approach. "The objective is to define that boundary which (1) allows parties to an exchange to obtain sufficient information to judge the fairness with which they are being dealt in the relationship and (2) to accomplish this task at minimum cost" [Ref. 27: p. 3].

Since a transaction is an economic exchange, and therefore quantifiable to some extent, cost/benefit analysis is relevant. When the costs of a transaction outweigh the benefits gained, consideration should be made towards

relocating the transaction in relation to the boundary. "Because the criterion if efficiency, we can in each case determine whether the moving of an organizational boundary will yield efficiency benefits or not" [Ref. 27: p. 2].

Governing transactions is accomplished differently internal and external to the boundary. External to the boundary, competition is recognized and the relevant governance mechanism is the market. Internally, competition does not guarantee equity to both parties therefore the governance mechanisms rely upon the recognition of some hierarcy. "The importance of a boundary lies in the difference in governance mechanisms which it implies...The objectives of an efficient boundary analysis is to discover the division between internal and external governance mechanisms that will yield the lowest cost of governance" [Ref. 27: p. 4]. Ouchi and Barney suggest that the proper selection of a transaction governance mechanism may effect the survival of an organization, particularly when resources are scarce.

Relating to the discussion presented in the previous chapter, it should be noted that both domain consensus and governance mechanisms influence resources. In an improper governance mechanism, resources are used inefficiently. In domain donsensus, resources are not obtained. It is suggested by the author, that an improper governance mechanism may influence the achievement of domain concensus.

With reference to NAVDAC and the user, the provision of data processing service is a transaction that takes place across a boundary line. The transaction takes on characteristics and is governed by a mechanism dependent upon whether the transaction is internal or external to the boundary.

1. Transaction Characteristics

Transactions or economic exchanges are characterized by three variables;

- The degree of performance accounting ambiguity,
- The degree of goal congruence between the parties, and
- The frequency of transaction occurance [Ref. 27: p. 7].

Performance ambiguity stems from two sources, "an inability to measure the performance of parties in an exchange and an inability, even if performance can be measured, to be able to accurately value it in the exchange" [Ref. 27: p. 7]. High performance ambiguity implies that competition will not ensure equity between parties and therefore the need for an internal governance mechanism. A low degree of performance ambiguity, where it is easy to value the exchange and measure the performance, can be accomplished through the market and therefore is external to the organization.

Goal congruence describes "the state of a relationship between two or more parties" [Ref. 27: p. 13]. High goal congruence implies that both parties are engaged in profit maximizing behavior and therefore governance takes place in the market. Low goal congruence requires transactions be governed internally in order to ensure fairness to all parties.

The frequency of a transaction's occurrance provides the means by which a cost/benefit analysis may be accomplished. The purpose is to determine whether the cost of establishing internal governance mechanisms doesn't outweigh the benefit received due to the low frequency of transaction occurance.

2. Governance Mechanisms

"Governance mechanisms are the social processes which serve the function of maintaining the perception of equity among the participants to a transaction" [Ref. 27: p. 15]. As mentioned previously, governance mechanisms can exist both internal and external to the organization dependent upon the characteristics of a specific transaction (performance ambiguity, goal congruence, and frequency). "External modes of governance achieve the perception of equity through a normative acceptance of competition in open markets as a legitimate form of social control. Internal modes of governance achieve this end through the normative acceptance of a legitimate hierarchy as the substitute for a competitive market" [Ref. 27: p. 15].

Figure 4.1 provides a breakdown of the types of governance mechanisms as they occur internal and external to the boundary and their basis in prices, rules, or values.

The internal mechanism can take on three forms, the quasi-market, the bureaucracy and the clan. A quasi-market exists when divisions are treated as profit centers and internal pricing mechanisms occur.

The bureaucracy and the clan form both rely upon the legitimate hierarchy, but the clan demonstrates the ability to accept "short-term inequity with the expectation of long-run equity" [Ref. 27: p. 20]. The bureaucracy with its reliance upon rules is characteristic "of functionally organized enterprises" [Ref. 27: p. 18].

External governance mechanisms can take on three forms, the market, the bureaucratically assisted market and the clan assisted market. The latter two are "external forms of bureaucratic and clan governance" [Ref. 27: p. 22] and are characterized by rules and values respectively. Within the external bureaucratic market legitimate authority is

Informational Basis of Governance Mechanisms

	Prices	Rules	Values and Norms
Internal Hierarchy	Quasi-Markets	Bureau-cracy	Clan
External Competition	Market	Bureaucratic assisted market	Clan assisted market

[Ref. 27: p. 16]

Figure 4.1 Governance Mechanisms.

passed to a third party which is recognized by both parties to the transaction. In the clan assisted market there is "a common belief that both parties to the exchange will act in a manner so as not to take advantage of the other" [Ref. 27: p. 24].

The existence of the bureaucratic and clan assisted markets suggest that a strictly competitive market fails to provide equity between parties at the lowest possible cost.

> Intermediate external governance forms such as clan and bureaucratically assisted markets arise when simple market prices fail. The key difference between the two governance mechanisms lies in the extent to which market prices are augmented by subtle, informal relations based on mutual trust and closeness, on the one hand, and rules, arbitration, and third party authorities on the other. [Ref. 27: p. 25]

Figure 4.2 maps the governance mechanisms just discussed to the transaction characteristics of goal congruence and performance accounting ambiguity. Note that when goal congruence between parties is low and performance ambiguity is high, no transaction will take place.

GOALS	Performance Accounting Ambiguity: High	Medium	Low
Low	no transaction	bureaucratic assisted market	market
Medium	bureaucracy	clan assisted market	market
High	clan	quasi-market	market

[Ref. 27: p. 28]

Figure 4.2 Transactions versus Governance.

D. NAVDAC AND NIF FUNDING

When the ADP Implementation Study was conducted prior to the formation of NAVDAC, the philosphy was that NAVDAC would be initially mission funded with an eventual progression towards a combination of mission funding and cost reimbursable funding. "If feasible, it is planned that users will budget and pay for ADP services and DPIs and DPPSOs of NAVDAC will be operated as cost centers" [Ref. 7: p. 48]. The rational behind this proposed transition was to place the responsibility for monitoring ADP costs upon the user. One of the problems identified by the ADP Implementation Study had been that "users, in general have no concept of ADP development and operational costs" [Ref. 7: v. 2, p. D-25]. By ceasing to provide ADP as a free good and by making the user responsible for his cost, economies were hoped to be realized.

1. The Model as It Applies to NAVDAC

NAVDAC and the NARDAC'S are currently mission funded, that is NAVDAC requests for and receives funds from Congress to maintain its operations. Services are provided to most customers at no cost (some customers, example being NARF's, work under a chargeback system where the NARDAC is reimbursed for costs incurred). Services are provided in three general areas;

- ADP application system development - includes analysis, design, programming and documentation of computer application programs,
- DPI services - running of applications programs or provision of computer capacity,
- Technical support services - consultant services.

The problem of unbudgeted costs is negotiated on a case by case basis, with the NARDAC absorbing such costs when possible. [Ref. 28: p. 2]

In terms of the model discussed in the previous section, mission funding is a transaction governed by internal mechanisms. Specifically the governance mechanism is a bureaucracy, where rules prevail. Rules stipulate the procedures by which NAVDAC obtains its resources (the POM process) and by which the customer then requests ADP services (NAVDACINST 5230.1A). The transaction specific to a bureaucratic governance mechanism is characterized by a medium degree of goal congruence and a high degree of performance accounting ambiguity. It is assumed that both NARDAC's and the customer are treated equitably.

Recent direction has dictated that NAVDAC will transfer to NIF funding in the near future. This move was prompted by a Government Accounting Office (GAO) report

("Accounting for Automated Data Processing Costs Needs Improvement", Feb. 7, 1978, B 115369) which noted that without proper cost accounting procedures, justifiable decisions could not be made regarding system replacement and that customers were not aware of costs generated by their proposals.

A transaction accomplished through NIF funding is governed through an external mechanism, specifically a bureaucratically assisted market. An actual transfer of funds occurs as in a market environment, but rules exist governing the utilization by users of non-NAVDAC ADP sources. This mechanism is characterized by a medium degree of performance ambiguity and a low degree of goal congruence.

The move from an internal to external governance mechanism suggests something about the transaction characteristics of performance ambiguity and goal congruence. With regard to performance accounting this suggests that the sale of data processing services is something that can and is quantifiable and sold on the market.

With regard to goal congruence, the move from mission funding to NIF funding suggests that it has proved diffucult to educate the user in ADP costing. The goals of the NARDAC's and the respective users have proved to be incongruent. NARDAC's exist to support customers with data processing services. The customer sees ADP as a tool to be used in the accomplishment of his individual mission. When this tool is offered free of charge, there is no incentive to economize.

The preceeding discussion suggests that mission funding of the NARDACs did not present the most efficient boundary, specifically in terms of cost. By moving to NIF funding, thereby externalizing the transaction, efficiency across the boundary is improved. Additionally by making

individual user commands responsible for funding ADP, NAVDAC is removed from the Congressional limelight. This will be discussed further in the following chapter.

If as has been suggested, users in the future receive permission to contract outside the NARDAC's for ADP services, the progression towards a strictly market governance mechanism will be complete. It should be noted that the concept of competition has been introduced. Implications are that the NARDAC's will be required to market their product at a competitive price if the survival of the organization is to be assured.

A question for future discussion is whether, by returning resource control back to the user, we are not returning to our position of six years ago. By placing responsibility for ADP costing upon the user, we place upon him the necessity to develop his own mechanisms for dealing across the boundary. This implies the creation of units internal to the user organization specifically designated to manage ADP. A natural progression appears to be the future decentralization of ADP billets so that commands have a qualified individual to assist with ADP.

E. CONCLUSIONS

During the course of the chapter it has been shown that the strategy adopted by NAVDAC is reflected in its organizational structure. The strategy was necessary to ensure the initial survival of the organization (domain consensus was achieved) and the structure exemplifies the strategy. This goodness of fit is vital for an organization, particularly during times of resource scarcity. Additionally we have seen how transactions, specifically the transfer of data processing services, can be moved with relation to the organizational boundary in order to increase efficiency.

The question that arises is assuming NAVDAC is not pursuing its complete mission, should it be reorganized, or perhaps should the mission be redefined to reflect the current organization, with the policy function located higher (at OP-942?). With regard to Chandler's thesis has NAVDAC reached that degree of inefficiency where organizational change is warranted?

A proposed reorganization is costly in terms of resources, particularly because of the personal upheaval it generates. Before embarking upon a reorganization the anticipated costs (particularly with regards to performance) should be weighed against potential benefits.

To propose a reorganization here without yet a clearly defined non-tactical ADP strategic management plan, would be tantamount to repeating the errors of six years ago. The primary obstruction to the development of an ADP strategic plan appears to be the lack of goal congruence between NAVDAC and the user. Although it seems that some suggestions might be warranted for future consideration. The idea presented is based upon the following assumptions:

- A Navy non-tactical ADP strategic management plan is produced and reflects the need to retain a centralized ADP command, responsible for the management of non-tactical ADP (budgeting, policy, AIS approval, standardization).
- Adequate support and guidance is provided to NAVDAC in the performance of the above mission.
- The NARDACs continue to be a viable concept, or if not the cost of another alternative (loss of control over standardization yielding functional duplication) outweighs the benefits (responsiveness) to be gained.

- NAVDAC achieves a domain consensus that a allows it to fully implement its mission.

The idea represents not so much a reorganization, because the supposition is that NAVDAC has not changed in its original intent, but a redesign to reflect the functions as currently defined in the mission statement.

1. Proposal

NAVDAC currently reflects a functional organization based upon products, systems software, applications software and computer center operations.

An alternative approach adopted from Gulab, is based upon what is accomplished in the course of administering data processing vice what is produced. The accomplishments include the;

- Operation of data processing installations,
- Provision for the purchase of or design in house of new products (equipment, and software), and
- Drafting of policy and standards.

The proposal envisions three divisions, the first division being composed of those functions from the codes 30, 40, 50, and 90 shops involved with NARDAC management. Specifically this division would be responsible for the short range, operational responsibilities of NAVDAC.

The second division would encompass Automated Information System Design and acquisition. It would be responsible for the approval, design and development of new hardware and software systems for use within the NARDAC's and Navy wide. By combining applications and systems software development in one division it is hoped to eliminate contention problems that have arisen in the past.

The third division would be responsible for long range planning and policy development. Currently these two functions exist in separate departments, an odd split since policy is normally viewed as being developed in support of strategic plans.

The proposal attempts to eliminate the conflict between long and short range planning by separating these two responsibilities into separate divisions. It also attempts to eliminate criticism that NAVDAC spends too much time on policy development, or NAVDAC spends too much time on NARDAC management, both of which were heard in the course of interviewing for this chapter.

The following chapter evaluates the criticism that has been directed towards NAVDAC concerning the performance of its mission.

V. NAVDAC: IT'S CRITICIZERS

A. INTRODUCTION

Control systems deal with the systematic collection, analysis and distribution of organizational information in an attempt to influence human behavior.

> Information and control systems typically try to influence behavior by specifying what kind of behavior is appropriate and by providing some means of gathering information about the adequacy of the behavior that takes place. Management uses this information for several purposes: to coordinate the activities of different parts of the organization; as a basis for taking corrective action where problems exist; and to reward and punish the behavior of members of the organization. [Ref. 29: p. 6]

The examination contained in this chapter will consider first the general characteristics of control systems, with particular emphasis upon the completeness and objectiveness of of measurement criteria. Also discussed will be the tendency of control systems to produce dysfunctional behavior when evaluation criteria are limited to a particular segment of the entire job.

Congressional oversight as an example of control will be examined, looking at the nature of the control, and the desired and achieved results. The author proposes that there is a lack of predefined standards for measurement and evaluation in the federal government. When standards are non existent, objective criticism is impossible. The position held is not that those individuals currently in the evaluator positions should not be there, but rather that the systems used be more clearly defined.

Finally internal Navy control systems will be discussed from the position that those measurement standards that do exist produce dysfunctional behavior by concentrating on only a segment of the entire NAVDAC mission.

The importance of control systems is that those who manage resources must be convinced of an organization's ability to handle such resources responsibly. "At the institutional level, organizations subject to norms of rationality measure their fitness for the future in satisficing terms. Even if an organization is convinced of its readiness for the future, its measurements must lead others to the same conclusion" [Ref. 20: p. 88].

B. THE NATURE OF CONTROL SYSTEMS

Control systems are described by looking at the evaluation criteria, feedback (speed, frequency, source) and the nature of the job being performed.

Control systems measure and when in conjunction with reward systems, reward individual performance insuring that performance is in line with organizational goals. As pointed out by Lawler and Rhode, motivation to come to work does not guarantee movtivation to perform effectively.

Table I is a classification of control systems presented by Lawler and Rhode. The table lists the characteristics of control systems and the values that they can assume. "The importance of the different dimensions varies as a function of which behavioral reaction is being considered and which group of people is being discussed" [Ref. 29: p. 45]. That is to say that the "proper" control system may differ depending upon the individual. Individual perceptions of the nature of the control system, such as fairness, also influence the effectiveness of the system in modifying behavior. This perception becomes particularly relevant

TABLE I

A Classification of Control Systems

Characteristics of Sensor Measures
- A. Complete - Incomplete
- B. Objective - Subjective
- C. Influenceable - Noninfluenceable

Nature of Standards
- D. Set by person being measured, superior, other higher level managers, staff people or others
- E. Very difficult - Very easy

Source of Discrimination
- F. Person being measured, superior, other higher level managers, staff people of others

Pattern of Communication
- G. Person being measured, his superior, his peers, his subordinates, top management, staff personnel, or others

Speed of Communication
- H. Immediate - Delayed by _____

Frequency of Communication
- I. Continuous - Every _____

Type of Activity
- J. Important - Unimportant

Source of Motivation
- K. Extrinsic, intrinsic rewards

[Ref. 29: p. 45]

when control systems are tied to reward and punishment. The perception of fairness may be influenced by the objectiveness of the standards, the ability of the individual to correct action, and the frequency of the feedback provided.

1. Dysfunction Effects

Dysfunctional behavior is that which interferes with the achievement of overall organizational goals. The conflict arises when organizational goals do not coincide with individual goals and vice versa. An implicit assumption here is that the organization has goals. For future discussion it will be assumed that the goal of NAVDAC, although unstated, is better management of non-tactical ADP, including management of the NARDAC's, system design and acquisition and policy/standards generation.

Two types of dysfunctional behavior are of interest in the context of this paper. The first is bureaucratic behavior. In rigid bureaucratic behavior an individual concentrates on performing those actions which are measured by a control system. This performance while causing "employees to behave in ways that look good in terms of the control system measures" may be "dysfunctional as far as the generally agreed upon goals of the organization are concerned" [Ref. 29: p. 83]. This result will be discussed later in the paper with regard to the Code 10 actions in NAVDAC.

The second form of dysfunctional behavior of interest is strategic behavior. In strategic behavior the individual alters "behaviors for a period of time to make the control system measures look acceptable" [Ref. 29: p. 86]. An example of strategic behavior would be on a production line, where 60% of the monthly quota is produced during the final 10 days of the month. Quota is met but in reality a much higher quota might be justified. As with bureaucratic behavior, strategic behavior is dysfunctional only when it conflicts with organizational goals.

2. Causes of Dysfunctional Behavior

Incomplete standards against which people and organizations are measured can cause bureaucratic and strategic dysfunctional behavior. Although complete standards themselves can result in dysfunctional behavior, such as resistance, "because it often is a threat to individual need satisfaction" [Ref. 29: p. 95]. When an individual finds it impossible to perform well in all areas of measured performance his self esteem is threatened and resistance arises. The more objective the standards are, the easier it becomes to identify deficiencies or incompleteness in the control system. Hence objectivity and completeness work together.

The nature of the standard influences the type of behavior produced. Inflexible standards, particularly those where the individual being measured had no input into the creation of the standard and views such standards as being unreasonably difficult, can cause bureaucratic and strategic behavior. The management by objective program (MBO) attempted to deal with this problem by including the employee in the goal setting process.

The choice of the individual doing the evaluating produces mixed results. When the individual being evaluated plays a part in the evaluation process, the occurance of dysfunctional behavior can be decreased. "Having the individual act as the discriminator tends to reduce rigid bureaucratic behavior and resistance" [Ref. 29: p. 103]. When feedback is negative though the individual may supress or invalidate evaluations.

The choice of individual to whom information concerning performance is returned can be a cause of dysfunctional behavior. "When information goes to someone (e.g., a superior) who either has or potentially has the power to give extrensic rewards, rigid bureaucratic

behavior, strategic behavior, and invalid data are much more likely to be present" [Ref. 29: p. 103]. The concept of reward systems being tied to control systems is particularly evident in the discussion of Congressional oversight which follows. In that situation, where evaluation is conducted in conjunction with budget hearings, not only rewards, but the ultimate survival of the organization is at stake.

The speed and frequency of feedback can cause dysfunctional behavior when reward systems are based upon information received. Although characteristics of feedback appear to be a secondary cause of dysfunctional behavior. Lawler and Rhode place more emphasis upon the completeness and nature of the standard as a primary cause.

The importance of an activity can influence the objectiveness of the standards and hence result in some form of dysfunctional behavior. "The more important an organization considers an activity the more likely measures of it are to be distorted" [Ref. 29: p. 108]. Organizationally important issues, especially when tied to reward systems, become individually important and hence increases the likelihood that dysfunctional behavior will result because of an individual's desire to look good. This factor is similar to incomplete measures, because particular activities are weighted more heavily than others creating an overconcentration on those items.

The previous discussion is summarized in the Table II which lists characteristics of control systems that produce dysfunctional behavior.

C. CONTROL OF NAVDAC

Recently substantial criticism has been directed at NAVDAC particularly by the House Appropriations Committee Survey and Investigations staff (HAC S&I). This portion of the paper examines the criticism directed at NAVDAC.

TABLE II

Characteristics of Control Systems

	ALL DYSFUNCTIONAL BEHAVIORS	BUREAUCRATIC BEHAVIOR	STRATEGIC BEHAVIOR
Characteristics of Sensor	a. Incomplete	Incomplete	—
	b. Subjective	Objective	Objective
	c. Uninfluenceable	Influenceable	—
Nature of Standard	d Set by others without participation	Set by others	Set by others
	e. Very difficult	Very difficult	Very difficult
Source of Discrimination	f. Superior or Other	Superior/Other	Superior/Other
Recipients of Communication	g. Superior or Other	Superior/Other	Superior/Other
Speed of Communication	h. Fast	Fast	Fast
Frequency of Communication	i. Frequency inappropriate	Frequent	Too infrequent
Type of Activity	j. Important	Important	Important

The general opinion is that no criteria were ever established against which NAVDAC could be measured. Congressional oversight is usually sporatic, with little to no follow up on the organizations plan to rectify noted deficiencies. The right of oversight is a constitutionally granted priviledge, but the constructiveness of Congressional criticism is questioned.

1. Problems Noted by the HAC S&I

Initial reservation was expressed during the HAC report on Department of Defense (DOD) appropriations for 1981. At that time it was stated that "the Committee wishes to express its doubts as to the ability of the Naval Data Automation Command to do its job of administering the non tactical ADP program" [Ref. 30: p. 149]. The Survey and Investigations staff was directed to examine NAVDAC's organization and operation.

2. Areas of Criticism

The HAC S&I returned its report to Congress in May 1981. The results were outlined in the Report of the House Committee on Appropriations for 1982. The five areas of concern were:

- ADP is not a major concern of top level Navy management.
- There is a need for better use of the CDAs.
- There is a morale problem in ADPSO.
- NARDAC's have not been productive in developing standardized systems.
- There should be continued decentralization of the CDAs.

Specifically with regard to concern by top level management the HAC stated that "ADP is perceived to be unimportant in the overall scheme of things to merit the interest and concern of several CNO staff echelons. As a result there is no cohesiveness in the management of ADP" [Ref. 22: p. 141]. The recommended solution proposed by the committee was to relocate NAVDAC higher in the organizational hierarchy.

The second area of concern involved the lack of progress exhibited by NAVDAC towards the creation of standardized systems. Noting that the functional sponsors had managed to standardize within their specific areas, the report stated that standardization across command lines had not been achieved. Progress made towards the development of some "standard" systems at NARDAC San Diego was discounted. "It is doubtful that the systems would ever be truly implemented Navy-wide because there is no official at the "top" who is likely to "champion" the standardization effort against expected resistance from those outside the NAVDAC community" [Ref. 22: p. 142-143]. The recommended solution

proposed was to effect greater control over the development of systems.

Comments directed towards ADPSO concerned the seemingly micro-management of the acquisition process, and the poor lines of communication with NAVDAC. It was felt that contract administration, which at the time under discussion consumed 80% of personnel resources, could best be managed elsewhere. The committee felt that "a more productive arrangement would be to merge ADPSO with NAVDAC headquarters Code 10 functions of review and approval of claimant ADPSO requests" [Ref. 22: p. 144]. It was also suggested that the "organization might best be structured on a team basis whereby each team becomes totally knowledgeable of a major claiments functions and needs and therefore able to reduce the time necessary for review and acquisition" [Ref. 22: p. 144]. It is suggested by the author that formation of teams around major claimant's functions might increase the lack of standardization across command lines discussed in the previous paragraph. The possibility exists of each team becoming dedicated to the mission needs of a particular major claiment. The suggestion presupposes an open mindedness towards standardization that appears to be lacking at the major claimant level. Instead organization around general functional areas (personnel, payroll, inventory) might alleviate this problem.

Criticism of the NARDAC's focused upon responsiveness to user requests, and the general overall quality of service provided. It was felt that the concept of a regionalized data processing center had been surpassed by technology. Sclutions included the use of NARDAC's for strictly standard systems or the return of NARDAC resources to the major user in the area. Prior to NAVDAC's formation, ADP oriented projects were in direct competition with the mission essential items of the individual controlling

commands. Individuals interviewed for this thesis have suggested that this situation provided commands with a source of money and billets when higher priorities arose. To take the latter approach would effectively return the Navy to the position at which it was six years ago, and the situation that NAVDAC was designed to correct. As pointed out in Chapter 4, the decentralization of resource control would relegate NAVDAC to an OP-91 equivalent, setting the Navy back 6 years.

The final area addressed by the committee concerned the future organizational position of the CDA's. As discussed in Chapter 3, the CDA's were excluded from NAVDAC but provision was made for their eventual incorporation at sometime in the future. The attitude exhibited by the Committee was that responsiveness was better and overall the user was better served by retaining control of the CDA's under the functional sponsors.

3. Comments on Congressional Oversight

The report of the HAC S&I is an example of a control system tied to a reward system. This section of the chapter evaluates the system against the characteristics discussed earlier.

a. Characteristics of the Measure

That a defined evaluation system is lacking comes as little surprise since NAVDAC itself lacks any such tool against which to measure its own progress. As pointed out previously incomplete measures can produce dysfunctional behavior. The question becomes "What happens when there are no published measures?"

As pointed out by Thompson, organizations which come under criticism point to past accomplishments in order to justify their continued existence. "Under norms of

rationality, organizations facing relatively stable task environments seek to demonstrate fitness for future action by demonstrating historical improvement" [Ref. 20: p. 89]. Since no measures exist, who can say that NAVDAC has not done an acceptable job. In that the term acceptable becomes subject to individual interpretation. The result becomes, that evaluator who carries the greatest power determines the evaluation. Congressional criticism of NAVDAC, although not tied to a defined control system, carries more weight, because adverse criticism implies less funding in the future.

b. Nature of the Standard

Since no previous published standard and milestones exist it becomes impossible to evaluate the standards as to their rigidness, or ease of accomplishment. It is suggested though that had NAVDAC and the Navy known the extent to which the Congressional evaluation would delve, it would have perceived the standards as being too all encompassing to be achieved in the time period allotted. This suggestion is based upon the observation that NAVDAC concentrated on the NARDAC portion of its mission, while Congressional criticism was directed at all portions of NAVDAC's mission.

c. Source of Discrimination

That Congress has the right and the responsibility to evaluate NAVDAC is not questioned. When resources are limited it becomes the duty of the controlling organization to ensure that resources are being managed in the best possible way.

d. Recipients of Communication

Because of the nature of the criticism levied against NAVDAC, and its Navy wide implications, it is felt that feedback was directed at the proper level.

e. Speed and Frequency of Communication

The budgeting procedure places its own timetable upon frequency of communication. As discussed earlier this factor is usually not a large contributer to dysfunctional behavior. A comment that should be made though concerns the nature of follow up on promises elicited to rectify noted deficiencies.

Correction of a noted deficiency creates a cost benefit trade off. The costs are the resources (money and time) required to effect a solution. The assumed benefits must be weighed against benefits to be gained if the resources were utilized elsewhere. An additional factor is the probability that follow up will not occur. Examples of tentatively postponed programs include the Strategic Management Plan for non-tactical ADP and the standardization program. Justification for the postponed standardization program hinges upon the assumption that a more effective program can be developed once an industry standard is set.

f. Type of Activity

Management of non-tactical ADP has been an important issue since the passage of the Brooks Bill in 1965. Congressional emphasis has been placed upon the efficiency of ADP operations. This emphasis, despite the relatively minor portion of the budget ADP consumes, tends to promote dysfunctional behavior.

D. INTERNAL EVALUATION OF NAVDAC

Internal to NAVDAC there appears little or no method of evaluating its performance as an organizational entity, nor that of the NARDAC's. Interviews with individuals connected to NAVDAC reveal that an evaluation strategy established for the NARDAC's has since been abandoned and that the internal NAVDAC MBO program is given only token attention.

Evaluation of the NARDAC's is conducted on the management by exception principle. If users are dissatisfied to the point that message traffic is generated, that particular NARDAC is not doing its job. Likewise if service received warrants a commendation, a message is sent and the relevant NARDAC is doing a good job. While a valid management tool, this practive forces NAVDAC into a reactionary role, and only augments the planning problem that currently obstructs NAVDAC.

Above NAVDAC in the organizational hierarchy, evaluation criteria appear to concentrate on approval of Automated Information System (AIS) requests. This criteria selects one division of NAVDAC (code 10), and concentrates on a small portion of the overall NAVDAC mission. From interviews this practice results in AIS plans being approved without proper documentation. Instead of returning deficient plans to the responsible (initiating) activity, telephone modifications are made and page changes to the relevant documents are submitted. The procedure is viable, and may provide adequate quality control as long as personnel in Code 10 are familiar with user activities and their proposed AIS. Potential for problem exists when employee turnover creates a loss of continuity and familiarity with user needs. Cost benefit analysis needs to be done to ensure that the procedure does not result in degredation.

NAVDAC appears efficient because the system acquisition process is smoother and takes less time. But the question that must be addressed concerns the user who submitted the initial request. What motivation does the user have to submit a complete and accurate request when he knows a patch job can be done on it?

A particularly interesting observation is that during interviews conducted, when asked what evaluation criteria were utilized to evaluate and control NAVDAC's performance, the most prevelant answer was that no defined criteria existed, but who else in the Navy had any either.

E. SUMMARY

As pointed out in the chapter, Congressional criticism of NAVDAC was based upon no predefined standard but gained legitimate authority in that Congress controls the resources. Requests for correction, elicited promises but no reevaluation was conducted to ensure compliance. Referencing the definition of control systems, information was collected by the HAC S&I, behavior modification was desired, but the amount achieved is subject to question.

Internal to the Navy evaluation concentrates on two areas, acquisition of new systems and NARDAC management. Standards in these two areas are undefined. Combined the two areas encompass only a portion of NAVDACs overall mission. When NAVDAC attempts to excell in these areas it exhibits bureaucratic and strategic dysfunctional behavior, because a vital portion of the mission is overlooked, that of Navy wide ADP management. The observation that other commands lack defined evaluation and control systems does not justify NAVDACs lack. It merely subjects others to the same subjective criticism.

VI. SUMMARY AND CONCLUSIONS

A. SUMMARY

Strategic planning is an on going organizational process, starting initially with the development of an activity mission and progressing through organizational goals and objectives, and finally short range operational plans. The discussion in the preceding chapters has centered on the question of what happens when the strategic planning process is not operational. With reference to the Navy, the lack of a strategic management plan for ADP has resulted in the development of a centralized ADP command, designed to correct the past rather than focusing on the future. This despite the fact that the Navy already had a centralized ADP command.

Secondly a discrepancy developed between NAVDAC's assigned mission and domain. The limited domain insured organizational survival but prevented NAVDAC from implementing its complete mission. This self imposed limitation resulted in a functionally oriented organizational structure designed towards DPI operation.

Finally the lack of a plan has resulted in NAVDAC being evaluated against non-existent standards, both internal and external to the Navy. It is therefore impossible to state objectively that NAVDAC has or has not fulfilled its expectations.

The Navy is currently in the process of attempting to formulate a strategic management plan for non tactical ADP. The current draft plan though exhibits the major problem that has obstructed such planning to date. There is a lack of consensus as to the purpose of ADP within the Navy.

If ADP is only a tool to be used in the performance of a given mission then it should be decentralized and the resources returned to the individual commands in order to make it as responsive as possible. Conversely if ADP is an end in itself, then all resources should be placed under the cognizance of a single command.

In reality there appears to be a combination of these philosophies existent within the Navy and hence the problem has arisen. The problem relects a short sightedness on the part of the user activities. There is an inability or unwillingness to see further than an individual activities mission.

B. THE FUTURE

Questions to be addressed in the future include:

- What are the ramifications of returning resource control to the user.
- What is standardization, what areas should be standardized, and at what point does standardization become detrimental.
- Where are we going with ADP in the future. What is NAVDAC's position in that future.

The National Academy of Science has been tasked with the responsibility of reviewing the future of non tactical ADP in the Navy and NAVDACs position in that future. It is feared than unless close attention is paid to the real requirements that the Navy will once again find itself implementing technology based upon the dictates of perceived technological pressures. The letter to the National Academy of Sciences stated that,

> Over the next decade, we expect Navy Automatic Data Processing (ADP) support to move from central data processing complexes to distributed systems that will put processing tools directly in the hands of the manager. [Ref. 31]

The point to be made is that until we identify future requirements, goals and objectives, we ought not to be planning on how we will fulfill these requirements.

APPENDIX A
LIST OF ACRONYMS

ADP	Automated Data Processing
ADPE	Automated Data Processing Equipment
ADPSO	Automated Data Processing Support Office
ADS	Automated Data System
AIS	Automated Information System
ASN (FM)	Assistant Secretary of the Navy for Financial Management
CASDO	Computer Application Systems Development Office
CDA	Central Design Activity
CENO	Central NOMIS Office
CNO	Chief of Naval Operations
DON	Department of the Navy
DPI	Data Processing Installation
DPPSO	Data Processing Support Office
FACSO	Facility Systems Office
FMSO	Fleet Material Support Office
GAO	General Accounting Office
MSDO	Management Systems Development Office
NARDAC	Navy Regional Data Automation Center
NARF	Naval Air Rework Facility

NAVAIR	Naval Air Systems Command
NAVDAC	Naval Data Automation Command
NAVDAF	Navy Regional Data Automation Facility
NAVFAC	Naval Facilities System Command
NAVMAT	Naval Material Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NIF	Navy Industrial Fund
OSD	Office of the Secretary of Defense
SSC	System Support Center
VCNO	Vice Chief of Naval Operations

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